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Gravitational-Wave Astrophysics: From GW150914 to GWTC-4.0

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The observation of gravitational waves (GWs) by the LIGO-Virgo-KAGRA (LVK) Collaboration has opened an entirely new window to study the universe. The landmark detection of the first signal in 2015, GW150914, confirmed a century-old prediction of General Relativity, initiating the field of Gravitational-Wave Astronomy. Ten years after this first detection, the LVK Collaboration has published over 300 public alerts across its four observing runs, corresponding to significant detection candidates. In August 2025, the LVK Collaboration published its fourth Gravitational-Wave Transient Catalog, GWTC-4.0. This catalog contains 128 new significant GW candidates, all of them associated with coalescing compact binaries. This talk presents a brief overview of the impact of the LVK detections in astrophysics, discussing, in particular, the most recent results obtained in the first part of the O4 run.

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Clasificación de la sesión : Plenary Session

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